



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,890	06/19/2001	Kazuoki Matsugatani	09952/058001 / 56782-US-K	4513
27572	7590	11/30/2004	EXAMINER	
HARNESSE, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			AHN, SAM K	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/885,890	Applicant(s) MATSUGATANI ET AL.	
	Examiner Sam K. Ahn	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13, 14, 16 and 19 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 15, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>061901</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-13, 15 and 19 are objected to because of the following informalities:

In claim 1, line 6, delete "within receiving" and insert "the received known".

In claim 11, line 3, delete "among the" and insert "among the plurality of".

In claim 11, line 8, delete "received signals" and insert "received known signals".

In claim 11, line 10, delete "the delay" and insert "a delay".

In claim 11, line 11, delete "each amount" and insert "each of the determined amount".

In claim 11, line 12, delete "setting time" and insert "setting a time".

In claim 15, line 13, delete "to each" and insert "to each of said".

Claims 2-10, 12, 13 and 19 directly or indirectly depend on claim 1 or 11.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10, 13 and 19 are rejected under 35 U.S.C. 112, first paragraph, because the claims recite single means without combining with another recited element of

means.

2164.08(a) Single Means Claim

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. *In re Hyatt*, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to *Hyatt* is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Thus, claims 1-5 recite single means without combining with another recited element of means, wherein claims 6-10, 13 and 19 directly or indirectly depend on claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 5, 14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Haardt et al., USP 6,311,043 B1 (Haardt).

Regarding claims 1, 14 and 16, Haardt teaches a communication device using a communication method of simultaneously transmitting and receiving a plurality of

N carriers to receive known signals by K (less than or equal to N) carriers among the N carriers, the device comprising M sets of antennas (antenna array) and receivers (see Fig.2); a delay information calculating unit (see outputs of DFT's in Fig.2) for determining from within the received known signals an amount of shift of amplitude and phase of each of the K carriers indicative of the known signal to determine an arrival direction (incidence direction) and delay information of receiving radio waves in response to thus determined amount of shift. (note col.6, lines 46-52, col.7, lines 40-55, and col.13, line 13 – col.14, line 58)

Regarding claim 5, Haardt teaches all subject matter claimed, as applied to claim 1. Haardt further teaches wherein the delay information calculating unit uses ESPRIT method. (note col.17, lines 29-43)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haardt et al., USP 6,311,043 B1 (Haardt) in view of Kuwahara, USP 6,084,928.

Regarding claim 4, Haardt teaches all subject matter claimed, as applied to claim 1. Although Haardt teaches wherein the delay information calculating unit uses

ESPRIT method, Haardt does not explicitly teach wherein the unit uses MUSIC method. Kuwahara also teaches calculation of delay information (note col.3, lines 30-41), and further teaches implementation of both ESPRIT and MUSIC method. Therefore, it would have been obvious to one skilled in the art at the time of the invention to implement MUSIC method in Haardt's system for the purpose of estimating the delay information without any mechanical movements, as taught by Kuwahara (note col.2, lines 21-32).

Regarding claim 9, Haardt teaches all subject matter claimed, as applied to claim 1. However, Haardt does not explicitly teach a compensator unit in response to the delay information. Kuwahara teaches calculation of arrival angle, delay time and relative power, wherein the information calculated is compensated by the control signal generator (24 in Fig.5 and note col.7, lines 58-67) coupled to the transmitter. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Haardt's system by having Kuwahara's compensator coupled to the transmitter and change the transmitting frequency for the purpose of having a feedback in response to the calculated delay information.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haardt et al., USP 6,311,043 B1 (Haardt) in view of Fujimoto et al., USP 6,115,426 (Fujimoto).

Regarding claim 10, Haardt teaches all subject matter claimed, as applied to claim 1. Although Haardt teaches receiving signals through an antenna array (note abstract) does not teach wherein a transmitter unit transmits signals having a guard interval added at a leading head thereof, and a time setting unit for setting time of the guard interval to a maximum configurable time.

Fujimoto also teaches the antenna array having a transmitter and a receiver (see Fig.10) and further teaches receiving signals wherein the signals have guard intervals (see T_g in Fig.5) and further setting the guard interval timing (note col.13, lines 44-53). Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Haardt's system by transmitting and receiving signals having plurality of data sequences, as is well-known in a multicarrier system (note col.2, lines 6-10), and further having a guard interval time set to a certain time for the purpose of setting the time to be longer than an expected delay time, thus prevent the signal from distortion (note col.13, lines 44-53). Although Fujimoto does not explicitly teach wherein the guard interval time is set to a max, it would have been a matter of design choice as to set the maximum configurable time as the expected delay time of Fujimoto. Applicant has not disclosed at which maximum configurable time provides an advantage, is used for a particular purpose or solves a stated problem.

One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Fujimoto's expected delay time because the time is set enough to prevent any distortion.

Therefore, it would have been obvious to one of ordinary skill in this art to modify Haardt's system by setting the expected delay time as the maximum configurable time to obtain the invention as specified in claim 10.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haardt et al., USP 6,311,043 B1 (Haardt) in view of Li et al., USP 6,587,526 B1 (Li).

Regarding claim 19, Haardt teaches all subject matter claimed, as applied to claim 1. Although Haardt teaches receiving signals through an antenna array (note abstract) does not teach wherein the communication method is an orthogonal multiplexing carrier method. Li also plurality of antennas wherein the receiver receiving the signal for computation of a delay is an OFDM signal. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Haardt's system by transmitting and receiving signals in an OFDM format for the purpose of increasing data transmission speed (note col.1, lines 12-23 and col.3, line 55 – col.5, line 9).

Allowable Subject Matter

7. Claims 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and overcome the claim objections.
8. Claims 11,12 and 15 would be allowable if rewritten or amended to overcome the claim objections set forth in this Office action.

9. The following is a statement of reasons for the indication of allowable subject matter:

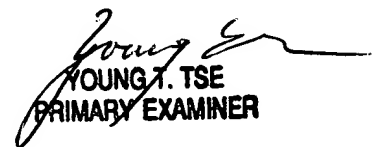
Present application discloses a communication device transceiving OFDM signals wherein the receiver computes the delay information comprising the amount of shift of amplitude, phase and direction of arrival. Closest prior art, Haardt, teaches all subject matter claimed. However, Haardt does not teach estimation of a carrier hole as claimed, and further does not teach a time information adding unit, as recited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
11/28/04


YOUNG T. TSE
PRIMARY EXAMINER